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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/615,885	07/08/2003	Baofu Duan	063170.7183	9839

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EXAMINER	
MARIAM, DANIEL G	

ART UNIT	PAPER NUMBER
2624	

DATE MAILED: 10/30/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/615,885	DUAN ET AL.	
	Examiner	Art Unit	
	DANIEL G. MARIAM	2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-28 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-28 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *See Continuation Sheet*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Continuation of Attachment(s) 3). Information Disclosure Statement(s) (PTO/SB/08), Paper No(s)/Mail Date :10/2/06,8/4/06,12/16/04 & 7/22/004.

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 1 and are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In claim1, line 6, the limitation "similarity *metric*" is unclear. What does the metric suppose to specify? A similar limitation also occurs in claim 16. Please clarify.

Since claims 2-15 and 17-28 directly or indirectly depend on claims 1 and 16 respectively, they are also rejected under 35 U.S.C. 112, second paragraph, for the same reason set forth above for claims 1 and 16.

3. Claims 12 and 25 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 12 recites the limitation "relationship measure includes R^2". What does this mean? Is the relationship measure defined by some mathematical formula? or does the system automatically trained to know and apply R^2 in the relationship measure without defining some mathematical formula? A similar limitation also occurs in claim 25. Please clarify

Claim Rejections - 35 USC § 101

4. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

The USPTO "Interim Guidelines for Examination of Patent Applications for Patent Subject Matter Eligibility" (Official Gazette notice of 22 November 2005), Annex IV, reads as follows:

> Claims that recite nothing but the physical characteristics of a form of energy, such as a frequency, voltage, or the strength of a magnetic field, define energy or magnetism, per se, and as such are nonstatutory natural phenomena. O'Reilly, 56 U.S. (15 How.) at 112-14. Moreover, it does not appear that a claim reciting a signal encoded with functional descriptive material falls within any of the categories of patentable subject matter set forth in Sec. 101.
>
> ... a signal does not fall within one of the four statutory classes of Sec. 101.
>
> ... signal claims are ineligible for patent protection because they do not fall within any of the four statutory classes of Sec. 101.

Claims 15 and 28 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter as follows. Claims 15 and 28 define a data signal with descriptive material. While "functional descriptive material" may be claimed as a statutory product (i.e., a "manufacture") when embodied on a tangible computer readable medium, a signal embodying that same functional descriptive material is neither a process nor a product (i.e., a tangible "thing") and therefore does not fall within one of the four statutory classes of § 101. Rather, "signal" is a form of energy, in the absence of any physical structure or tangible material.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1-11, 13-24, and 26-28 are rejected under 35 U.S.C. 102(b) as being anticipated by Yamakawa, et al (6,341,283).

With regard to claim 1, as best understood, Yamakawa, et al discloses a method for feature selection, i.e., feature quantity/attribute selection, based on hierarchical, local-region, feature spaces, analysis of feature characteristics in a data set, comprising: partitioning, i.e., decomposing, a data space associated with a data set into a hierarchy of pluralities of local regions (See for example, Figs. 3 & 8; and col. 2, lines 13-33); using a similarity metric, i.e., matchability, to evaluate for each local region a relationship measure between input features and a selected output feature, and identifying one or more relevant, i.e., valid, features, by using the relationship measure for each local region (See col. 14, lines 9-56; and Fig. 8).

With regard to claim 2, the method of claim 1 further comprising: determining a feature relevancy of a selected feature by performing a weighted sum of the relationship measures for the selected feature over the plurality of local regions (See for example, col. 14, lines 38-43).

With regard to claim 3, the method of claim 2, wherein weights for the weighted sum are based on sizes of the respective local regions (See for example, col. 14, lines 42-43).

With regard to claim 4, the method of claim 1, wherein the partitioning of the data space into the hierarchy of pluralities of local regions is performed by hierarchical clustering (given the broadest reasonable interpretation, this feature reads on class/cataloging) of the data set in a plurality of levels (See for example, col. 2, lines 34-56; and Fig. 8).

With regard to claim 5, the method of claim 4, wherein feature relevancies are determined for each of the input features based on the relationship measures at each level of the hierarchical clustering and the relevant features are identified based on the feature relevancies (See Fig. 8).

With regard to claim 6, the method of claim 1 further comprising: determining for each local region a corresponding subset, i.e., partial, of relevant features based on the relationship measures for the local region (See for example, col. 14, lines 14-45).

With regard to claim 7, the method of claim 6, wherein the subsets of relevant features for respective local regions are non-identical (See Fig. 8).

With regard to claim 8, the method of claim 1, wherein the local regions are nonoverlapping (See for example, Fig. 3).

With regard to claim 9, the method of claim 1, wherein the similarity metric, i.e., matchability, is linear (See Fig. 8).

With regard to claim 10, the method of claim 1, wherein the similarity metric includes a projection or distance (See for example, Fig. 12).

With regard to claim 11, the method of claim 1, wherein the relationship measure includes a correlation, i.e., matchability (See col. 7, line 14; and Fig. 8).

With regard to claim 13, a computer system, comprising: a processor, i.e., CPU, and a program storage device, i.e., ROM or memory apparatus, readable by the computer system, tangibly embodying a program of instructions executable by the processor to perform the method claimed in claim 1 (See Fig. 7).

With regard to claim 14, a program storage device readable by a machine, tangibly embodying a program of instructions executable by the machine to perform the method claimed in claim 1 (See for example, items 71 or 74, in Fig. 7).

With regard to claim 15, a computer data signal transmitted in one or more segments in a transmission medium which embodies instructions executable by a computer to perform the method claimed in claim 1 (which reads on items 79 or 76, in Fig. 7).

With regard to claim 16, claim 2 encompasses the limitation of this claim, and is rejected the same as claim 1 except claim 16 is directed to a method claim. Thus, argument similar to that presented above for claim 2 is applicable to claim 16.

Claims 17, 18, 19, 21, 22, 23, and 24 are rejected the same as claims 4, 5, 3, 8, 9, 10, and 11 respectively except claims 17, 18, 19, 21, 22, 23, and 24 are method claims. Thus, arguments analogous to those presented above for claims 4, 5, 3, 8, 9, 10, and 11 are respectively applicable to claims 17, 18, 19, 21, 22, 23, and 24.

With regard to claim 20, the method of claim 16 further comprising: ranking, i.e., arranging, re-arranging or ordering, the input features according to the corresponding feature relevancies of the input features (See for example, col. 9, line 63-col. 10, line 51).

Claims 26, 27, and 28 are rejected the same as claims 13, 14, and 15 respectively. Thus, arguments analogous to those presented above for claims 13, 14, and 15 are respectively applicable to claims 26, 27, and 28.

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. US Patent Numbers: 6728706 and 6859802; and a publication to: Krusinska "Two step semi optimal branch and bound algorithm for feature selection in mixed variable discrimination"; Hall, et al "Benchmarking attribute selection techniques for discrete class data

mining"; Jain, et al "Feature selection: evaluation, application, and small sample performance"; and Tusk, et al "Automated feature selection through relevance feedback".

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DANIEL G. MARIAM whose telephone number is 571-272-7394. The examiner can normally be reached on M-F (7:00-4:30) FIRST FRIDAY OFF.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, MATTHEW BELLA can be reached on 571-272-7778. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

DANIEL G MARIAM
Primary Examiner
Art Unit 2624

October 25, 2006